

#12

"Express Mail" mailing number.: EV155320452US
Date of Deposit July 26, 2002
I hereby certify that this paper and all papers and fees referred to herein are being deposited with the United States Postal Service "Express Mail Patent Office to Addressee" service under 37 C.F.R. 1.10 on the date indicated above and is addressed to the Commissioner of Patents, c/o U.S. Patent and Trademark Office, BOX SEQUENCE, P.O. Box 2327, Arlington, Virginia 22202



Bonnie S. Sheridan
Bonnie S. Sheridan

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of: Balser et al.

Examiner: Not Assigned

Application No.: 10/000,151

Group Art Unit: Not Assigned

Filed: October 30, 2001

Docket No.: 1242/49/2

Confirmation No.: 8248

For: HUMAN KCR1 REGULATION OF HERG POTASSIUM CHANNEL BLOCK

STATEMENT THAT SEQUENCE LISTING AND
COMPUTER READABLE COPY ARE THE SAME

Commissioner for Patents
c/o United States Patent and Trademark Office
BOX SEQUENCE
P.O. Box 2327
Arlington, Virginia 22202

Sir:

In accordance with 37 C.F.R. §1.821(f), applicants hereby state that the Sequence Listing information recorded in computer readable form is identical to the written Sequence Listing (on paper or compact disc).

The Commissioner is hereby authorized to charge any deficiencies of payment associated with the filing of this correspondence to Deposit Account No. 50-0426.

Respectfully submitted,

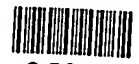
JENKINS & WILSON, P.A.

Date: July 26, 2002

By: Arles A. Taylor, Jr.
Arles A. Taylor, Jr.
Registration No. 39,395

Suite 1400 University Tower
3100 Tower Boulevard
Durham, North Carolina 27707
Telephone: (919) 493-8000
Facsimile: (919) 419-0383

Customer No. Bar Code Label:



25297

1242/49/2 AAT/haw/ptw

PATENT TRADEMARK OFFICE

This Page Is Inserted by IFW Operations
and is not a part of the Official Record

BEST AVAILABLE IMAGES

Defective images within this document are accurate representations of the original documents submitted by the applicant.

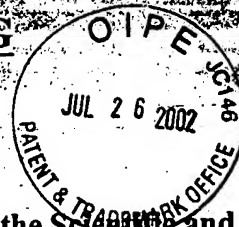
Defects in the images may include (but are not limited to):

- BLACK BORDERS
- TEXT CUT OFF AT TOP, BOTTOM OR SIDES
- FADED TEXT
- ILLEGIBLE TEXT
- SKEWED/SLANTED IMAGES
- COLORED PHOTOS
- BLACK OR VERY BLACK AND WHITE DARK PHOTOS
- GRAY SCALE DOCUMENTS

IMAGES ARE BEST AVAILABLE COPY.

**As rescanning documents *will not* correct images,
please do not report the images to the
Image Problem Mailbox.**

RAW SEQUENCE LISTING ERROR REPORT



The Biotechnology Systems Branch of the Scientific and Technical Information Center (STIC) detected errors when processing the following computer readable form:

Application Serial Number:

10/000,151A

Source:

OIPF

Date Processed by STIC:

5/13/02

THE ATTACHED PRINTOUT EXPLAINS DETECTED ERRORS.

PLEASE FORWARD THIS INFORMATION TO THE APPLICANT BY EITHER:

- 1) INCLUDING A COPY OF THIS PRINTOUT IN YOUR NEXT COMMUNICATION TO THE APPLICANT, WITH A NOTICE TO COMPLY or,
- 2) TELEPHONING APPLICANT AND FAXING A COPY OF THIS PRINTOUT, WITH A NOTICE TO COMPLY

FOR CRF SUBMISSION QUESTIONS, PLEASE CONTACT MARK SPENCER, 703-308-4212.

FOR SEQUENCE RULES INTERPRETATION, PLEASE CONTACT ROBERT WAX, 703-308-4216.

PATENTIN 2.1 e-mail help: patin21help@uspto.gov or phone 703-306-4119 (R. Wax)

PATENTIN 3.0 e-mail help: patin3help@uspto.gov or phone 703-306-4119 (R. Wax)

TO REDUCE ERRORED SEQUENCE LISTINGS, PLEASE USE THE CHECKER VERSION 3.1 PROGRAM, ACCESSIBLE THROUGH THE U.S. PATENT AND TRADEMARK OFFICE WEBSITE. SEE BELOW FOR ADDRESS:

<http://www.uspto.gov/web/offices/pac/checker>

Applicants submitting genetic sequence information electronically on diskette or CD-Rom should be aware that there is a possibility that the disk/CD-Rom may have been affected by treatment given to all incoming mail. Please consider using alternate methods of submission for the disk/CD-Rom or replacement disk/CD-Rom. Any reply including a sequence listing in electronic form should NOT be sent to the 20231 zip code address for the United States Patent and Trademark Office, and instead should be sent via the following to the indicated addresses:

1. EFS-Bio (<<http://www.uspto.gov/ebc/efs/downloads/documents.htm>> , EFS Submission User Manual - ePAVE)
2. U.S. Postal Service: U.S. Patent and Trademark Office, Box Sequence, P.O. Box 2327, Arlington, VA 22202
3. Hand Carry directly to:
U.S. Patent and Trademark Office, Technology Center 1600, Reception Area, 7th Floor, Examiner Name, Sequence Information, Crystal Mall One, 1911 South Clark Street, Arlington, VA 22202
Or
U.S. Patent and Trademark Office, Box Sequence, Customer Window, Lobby, Room 1B03, Crystal Plaza Two, 2011 South Clark Place, Arlington, VA 22202
4. Federal Express, United Parcel Service, or other delivery service to: U.S. Patent and Trademark Office, Box Sequence, Room 1B03-Mailroom, Crystal Plaza Two, 2011 South Clark Place, Arlington, VA 22202

Revised 01/29/2002



OIPE

Does Not Comply
Corrected Diskette Needed

RAW SEQUENCE LISTING

DATE: 05/13/2002

PATENT APPLICATION: US/10/000,151A

TIME: 09:08:39

Input Set : A:\HERG-KCR1rev1.ST25.txt

Output Set: N:\CRF3\05102002\J000151A.raw

3 <110> APPLICANT: Vanderbilt University
 4 Balser, Jeffrey
 5 George, Alfred
 6 Roden, Dan
 8 <120> TITLE OF INVENTION: HUMAN KCR1 REGULATION OF HERG POTASSIUM CHANNEL BLOCK
 10 <130> FILE REFERENCE: 1242-49-2
 12 <140> CURRENT APPLICATION NUMBER: US/10/000,151A
 C--> 13 <141> CURRENT FILING DATE: 2002-04-29
 15 <150> PRIOR APPLICATION NUMBER: 60/244,340
 16 <151> PRIOR FILING DATE: 2000-10-30
 18 <160> NUMBER OF SEQ ID NOS: 7
 20 <170> SOFTWARE: PatentIn version 3.0
 22 <210> SEQ ID NO: 1
 23 <211> LENGTH: 1857
 24 <212> TYPE: DNA
 25 <213> ORGANISM: Homo sapiens
 27 <220> FEATURE:
 28 <221> NAME/KEY: CDS
 29 <222> LOCATION: (1)..(1422) *detected*
 30 <223> OTHER INFORMATION: n is any nucleotide *ns beyond the designated range!*
 33 <400> SEQUENCE: 1
 34 atg gcg cag cta gag ggt tac tgt ttc tcg gcc gcc ttg agc tgt acc 48
 35 Met Ala Gln Leu Glu Gly Tyr Cys Phe Ser Ala Ala Leu Ser Cys Thr
 36 1 5 10 15
 38 ttt tta gtg tcc tgc ctc ctc ttc tcc gcc ttc agc cgg gcg ctg cga 96
 39 Phe Leu Val Ser Cys Leu Leu Phe Ser Ala Phe Ser Arg Ala Leu Arg
 40 20 25 30
 42 gag ccc tac atg gac gag atc ttc cac ctg cct cag gcg cag cgc tac 144
 43 Glu Pro Tyr Met Asp Glu Ile Phe His Leu Pro Gln Ala Gln Arg Tyr
 44 35 40 45
 46 tgt gag ggc cat ttc tcc ctt tcc cag tgg gat ccc atg att act aca 192
 47 Cys Glu Gly His Phe Ser Leu Ser Gln Trp Asp Pro Met Ile Thr Thr
 48 50 55 60
 50 tta cct ggc ttg tac ctg gtg tca gtt gga gtg gtc aaa cct gcc att 240
 51 Leu Pro Gly Leu Tyr Leu Val Ser Val Gly Val Val Lys Pro Ala Ile
 52 65 70 75 80
 54 tgg atc ttt gga tgg tct gaa cat gtt gtc tgc tcc att ggg atg ctc 288
 55 Trp Ile Phe Gly Trp Ser Glu His Val Val Cys Ser Ile Gly Met Leu
 56 85 90 95
 58 aga ttt gtt aat ctt ctc ttc agt gtt ggc aac ttc tat tta cta tat 336
 59 Arg Phe Val Asn Leu Leu Phe Ser Val Gly Asn Phe Tyr Leu Leu Tyr
 60 100 105 110
 62 ttg ctt ttc cac aag gta caa ccc aga aac aag gct gcc tca agt atc 384

RAW SEQUENCE LISTING

DATE: 05/13/2002

PATENT APPLICATION: US/10/000,151A

TIME: 09:08:39

Input Set : A:\HERG-KCR1rev1.ST25.txt

Output Set: N:\CRF3\05102002\J000151A.raw

63	Leu	Leu	Phe	His	Lys	Val	Gln	Pro	Arg	Asn	Lys	Ala	Ala	Ser	Ser	Ile	
64			115					120					125				
66	cag	aga	gtc	ttg	tca	aca	tta	aca	cta	gca	gta	ttt	cca	aca	ctt	tat	432
67	Gln	Arg	Val	Leu	Ser	Thr	Leu	Thr	Leu	Ala	Val	Phe	Pro	Thr	Leu	Tyr	
68		130					135					140					
70	ttt	ttt	aac	ttc	ctt	tat	tat	aca	gaa	gca	gga	tct	atg	ttt	ttt	act	480
71	Phe	Phe	Asn	Phe	Leu	Tyr	Tyr	Thr	Glu	Ala	Gly	Ser	Met	Phe	Phe	Thr	
72	145					150				155					160		
74	ctt	ttt	gca	tat	ttg	atg	tgt	ctt	tat	gga	aat	cat	aaa	act	tca	gcc	528
75	Leu	Phe	Ala	Tyr	Leu	Met	Cys	Leu	Tyr	Gly	Asn	His	Lys	Thr	Ser	Ala	
76				165					170				175				
78	ttc	ctt	gga	ttt	tgt	ggc	ttc	atg	ttt	cgg	caa	aca	aat	atc	atc	tgg	576
79	Phe	Leu	Gly	Phe	Cys	Gly	Phe	Met	Phe	Arg	Gln	Thr	Asn	Ile	Ile	Trp	
80			180					185					190				
82	gct	gtc	ttc	tgt	gca	ggg	aat	gtc	att	gca	caa	aag	tta	act	gag	gct	624
83	Ala	Val	Phe	Cys	Ala	Gly	Asn	Val	Ile	Ala	Gln	Lys	Leu	Thr	Glu	Ala	
84			195				200					205					
86	tgg	aaa	act	gag	cta	caa	aag	aag	gaa	gac	aga	ctt	cca	cct	att	aaa	672
87	Trp	Lys	Thr	Glu	Leu	Gln	Lys	Lys	Glu	Asp	Arg	Leu	Pro	Pro	Ile	Lys	
88		210				215				220							
90	gga	cca	ttt	gca	gaa	ttc	aga	aaa	att	ctt	cag	ttt	ctt	ttg	gct	tat	720
91	Gly	Pro	Phe	Ala	Glu	Phe	Arg	Lys	Ile	Leu	Gln	Phe	Leu	Leu	Ala	Tyr	
92	225			230				235				240					
94	tcc	atg	tcc	ttt	aaa	aac	ttg	agt	atg	ctt	ttc	tgt	ttg	act	tgg	ccc	768
95	Ser	Met	Ser	Phe	Lys	Asn	Leu	Ser	Met	Leu	Phe	Cys	Leu	Thr	Trp	Pro	
96			245					250				255					
98	tac	atc	ctt	ctg	gga	ttt	ctg	ttt	tgt	gct	ttt	gta	gta	gtt	aat	ggt	816
99	Tyr	Ile	Leu	Leu	Gly	Phe	Leu	Phe	Cys	Ala	Phe	Val	Val	Val	Asn	Gly	
100			260				265				270						
102	gga	att	gtt	att	ggc	gat	cgg	agt	agt	cat	gaa	gcc	tgt	ctt	cat	ttt	864
103	Gly	Ile	Val	Ile	Gly	Asp	Arg	Ser	Ser	His	Glu	Ala	Cys	Leu	His	Phe	
104		275				280				285							
106	cct	caa	cta	ttc	tac	ttt	ttt	tca	ttt	act	ctc	ttt	ttt	tct	ttt	cct	912
107	Pro	Gln	Leu	Phe	Tyr	Phe	Phe	Ser	Phe	Thr	Leu	Phe	Phe	Ser	Phe	Pro	
108		290				295				300							
110	cat	ctc	ctg	tct	cct	agc	aaa	att	aag	act	ttt	ctt	tcc	tta	gtt	tgg	960
111	His	Leu	Leu	Ser	Pro	Ser	Lys	Ile	Lys	Thr	Phe	Leu	Ser	Leu	Val	Trp	
112	305			310				315				320					
114	aaa	cat	gga	att	ctg	ttt	ttg	gtg	gtt	acc	tta	gtc	tct	gtg	ttt	tta	1008
115	Lys	His	Gly	Ile	Leu	Phe	Leu	Val	Val	Thr	Leu	Val	Ser	Val	Phe	Leu	
116			325					330				335					
118	gtt	tgg	aaa	ttc	act	tat	gct	cat	aaa	tac	ttg	cta	gca	gac	aat	aga	1056
119	Val	Trp	Lys	Phe	Thr	Tyr	Ala	His	Lys	Tyr	Leu	Leu	Ala	Asp	Asn	Arg	
120			340				345			350							
122	cat	tat	act	ttc	tat	gtg	tgg	aaa	aga	gtt	ttt	caa	aga	tat	gca	att	1104
123	His	Tyr	Thr	Phe	Tyr	Val	Trp	Lys	Arg	Val	Phe	Gln	Arg	Tyr	Ala	Ile	
124		355				360				365							
126	ctg	aaa	tat	ttg	tta	gtt	cca	gcc	tat	ata	ttt	gct	ggt	tgg	agt	ata	1152
127	Leu	Lys	Tyr	Leu	Leu	Val	Pro	Ala	Tyr	Ile	Phe	Ala	Gly	Trp	Ser	Ile	

RAW SEQUENCE LISTING

DATE: 05/13/2002

PATENT APPLICATION: US/10/000,151A

TIME: 09:08:39

Input Set : A:\HERG-KCR1rev1.ST25.txt

Output Set: N:\CRF3\05102002\J000151A.raw

```

128      370      375      380
130 gct gac tca ttg aaa tca aag cca att ttt tgg aat tta atg ttt ttc      1200
131 Ala Asp Ser Leu Lys Ser Lys Pro Ile Phe Trp Asn Leu Met Phe Phe
132 385      390      395      400
134 ata tgc ttg ttc att gtt ata gtt cct cag aaa ctg ctg gaa ttt cgt      1248
135 Ile Cys Leu Phe Ile Val Ile Val Pro Gln Lys Leu Leu Glu Phe Arg
136      405      410      415
138 tac ttc att tta cct tat gtc att tat agg ctt aac ata act ctg cct      1296
139 Tyr Phe Ile Leu Pro Tyr Val Ile Tyr Arg Leu Asn Ile Thr Leu Pro
140      420      425      430
142 ccc aca tcc aga ctt gtt tgt gaa ctg agt tgc tat gca att gtt aat      1344
143 Pro Thr Ser Arg Leu Val Cys Glu Leu Ser Cys Tyr Ala Ile Val Asn
144      435      440      445
146 ttc ata act ttt tac atc ttt ctg aac aag act ttt cag tgg cca aat      1392
147 Phe Ile Thr Phe Tyr Ile Phe Leu Asn Lys Thr Phe Gln Trp Pro Asn
148      450      455      460
150 agt cag gac att caa agg ttt atg tgg taa tatcagtgat attttgaact      1442
151 Ser Gln Asp Ile Gln Arg Phe Met Trp
152 465      470
W--> 154 gtaaaaatgg acttaataat agaccatttc tacaaagaac aactgaatag gnggaaaaca      1502
156 tgggaatttct ttttaggtgca gtggtggtct tcaaattaca ttagtttttt taatatatat      1562
158 ttttaacata tgtaagaaat taagtggcaa agaactggga aagcttaaga cctgcttcaa      1622
W--> 160 angcctgaat aatgggaaaa taaanwngtt tncagatatc tcatatcgct cnnnknatgn      1682
162 tggcccytmn caangcttgg gaatgkttnn wntgnataag ttnattaaan ctgggnntgc      1742
W--> 164 tnnmwatnac ttnnnkncca nccwnnnwac natgnntan nnantattta caaaggtcag      1802
W--> 166 gtgatattct tgactgaaaa gtgctctnaa cataaaagta aatatnggcc ncaaa      1857
169 <210> SEQ ID NO: 2
170 <211> LENGTH: 473
171 <212> TYPE: PRT
172 <213> ORGANISM: Homo sapiens
174 <400> SEQUENCE: 2
176 Met Ala Gln Leu Glu Gly Tyr Cys Phe Ser Ala Ala Leu Ser Cys Thr
177 1      5      10      15
180 Phe Leu Val Ser Cys Leu Leu Phe Ser Ala Phe Ser Arg Ala Leu Arg
181      20      25      30
184 Glu Pro Tyr Met Asp Glu Ile Phe His Leu Pro Gln Ala Gln Arg Tyr
185      35      40      45
188 Cys Glu Gly His Phe Ser Leu Ser Gln Trp Asp Pro Met Ile Thr Thr
189      50      55      60
192 Leu Pro Gly Leu Tyr Leu Val Ser Val Gly Val Val Lys Pro Ala Ile
193 65      70      75      80
196 Trp Ile Phe Gly Trp Ser Glu His Val Val Cys Ser Ile Gly Met Leu
197      85      90      95
200 Arg Phe Val Asn Leu Leu Phe Ser Val Gly Asn Phe Tyr Leu Leu Tyr
201      100      105      110
204 Leu Leu Phe His Lys Val Gln Pro Arg Asn Lys Ala Ala Ser Ser Ile
205      115      120      125
208 Gln Arg Val Leu Ser Thr Leu Thr Leu Ala Val Phe Pro Thr Leu Tyr
209      130      135      140

```

RAW SEQUENCE LISTING

DATE: 05/13/2002

PATENT APPLICATION: US/10/000,151A

TIME: 09:08:39

Input Set : A:\HERG-KCRLrev1.ST25.txt

Output Set: N:\CRF3\05102002\J000151A.raw

```

212 Phe Phe Asn Phe Leu Tyr Tyr Thr Glu Ala Gly Ser Met Phe Phe Thr
213 145 150 155 160
216 Leu Phe Ala Tyr Leu Met Cys Leu Tyr Gly Asn His Lys Thr Ser Ala
217 165 170 175
220 Phe Leu Gly Phe Cys Gly Phe Met Phe Arg Gln Thr Asn Ile Ile Trp
221 180 185 190
224 Ala Val Phe Cys Ala Gly Asn Val Ile Ala Gln Lys Leu Thr Glu Ala
225 195 200 205
228 Trp Lys Thr Glu Leu Gln Lys Lys Glu Asp Arg Leu Pro Pro Ile Lys
229 210 215 220
232 Gly Pro Phe Ala Glu Phe Arg Lys Ile Leu Gln Phe Leu Leu Ala Tyr
233 225 230 235 240
236 Ser Met Ser Phe Lys Asn Leu Ser Met Leu Phe Cys Leu Thr Trp Pro
237 245 250 255
240 Tyr Ile Leu Leu Gly Phe Leu Phe Cys Ala Phe Val Val Val Asn Gly
241 260 265 270
244 Gly Ile Val Ile Gly Asp Arg Ser Ser His Glu Ala Cys Leu His Phe
245 275 280 285
248 Pro Gln Leu Phe Tyr Phe Phe Ser Phe Thr Leu Phe Phe Ser Phe Pro
249 290 295 300
252 His Leu Leu Ser Pro Ser Lys Ile Lys Thr Phe Leu Ser Leu Val Trp
253 305 310 315 320
256 Lys His Gly Ile Leu Phe Leu Val Val Thr Leu Val Ser Val Phe Leu
257 325 330 335
260 Val Trp Lys Phe Thr Tyr Ala His Lys Tyr Leu Leu Ala Asp Asn Arg
261 340 345 350
264 His Tyr Thr Phe Tyr Val Trp Lys Arg Val Phe Gln Arg Tyr Ala Ile
265 355 360 365
268 Leu Lys Tyr Leu Leu Val Pro Ala Tyr Ile Phe Ala Gly Trp Ser Ile
269 370 375 380
272 Ala Asp Ser Leu Lys Ser Lys Pro Ile Phe Trp Asn Leu Met Phe Phe
273 385 390 395 400
276 Ile Cys Leu Phe Ile Val Ile Val Pro Gln Lys Leu Leu Glu Phe Arg
277 405 410 415
280 Tyr Phe Ile Leu Pro Tyr Val Ile Tyr Arg Leu Asn Ile Thr Leu Pro
281 420 425 430
284 Pro Thr Ser Arg Leu Val Cys Glu Leu Ser Cys Tyr Ala Ile Val Asn
285 435 440 445
288 Phe Ile Thr Phe Tyr Ile Phe Leu Asn Lys Thr Phe Gln Trp Pro Asn
289 450 455 460
292 Ser Gln Asp Ile Gln Arg Phe Met Trp
293 465 470
296 <210> SEQ ID NO: 3
297 <211> LENGTH: 1159
298 <212> TYPE: PRT
299 <213> ORGANISM: Homo sapiens
301 <400> SEQUENCE: 3
303 Met Pro Val Arg Arg Gly His Val Ala Pro Gln Asn Thr Phe Leu Asp
304 1 5 10 15

```

RAW SEQUENCE LISTING

DATE: 05/13/2002

PATENT APPLICATION: US/10/000,151A

TIME: 09:08:39

Input Set : A:\HERG-KCR1rev1.ST25.txt

Output Set: N:\CRF3\05102002\J000151A.raw

```

306 Thr Ile Ile Arg Lys Phe Glu Gly Gln Ser Arg Lys Phe Ile Ile Ala
307      20      25      30
309 Asn Ala Arg Val Glu Asn Cys Ala Val Ile Tyr Cys Asn Asp Gly Phe
310      35      40      45
312 Cys Glu Leu Cys Gly Tyr Ser Arg Ala Glu Val Met Gln Arg Pro Cys
313      50      55      60
315 Thr Cys Asp Phe Leu His Gly Pro Arg Thr Gln Arg Arg Ala Ala Ala
316 65      70      75      80
318 Gln Ile Ala Gln Ala Leu Leu Gly Ala Glu Glu Arg Lys Val Glu Ile
319      85      90      95
321 Ala Phe Tyr Arg Lys Asp Gly Ser Cys Phe Leu Cys Leu Val Asp Val
322      100      105      110
324 Val Pro Val Lys Asn Glu Asp Gly Ala Val Ile Met Phe Ile Leu Asn
325      115      120      125
327 Phe Glu Val Val Met Glu Lys Asp Met Val Gly Ser Pro Ala His Asp
328      130      135      140
330 Thr Asn His Arg Gly Pro Pro Thr Ser Trp Leu Ala Pro Gly Arg Ala
331 145      150      155      160
333 Lys Thr Phe Arg Leu Lys Leu Pro Ala Leu Leu Ala Leu Thr Ala Arg
334      165      170      175
336 Glu Ser Ser Val Arg Ser Gly Gly Ala Gly Gly Ala Gly Ala Pro Gly
337      180      185      190
339 Ala Val Val Val Asp Val Asp Leu Thr Pro Ala Ala Pro Ser Ser Glu
340      195      200      205
342 Ser Leu Ala Leu Asp Glu Val Thr Ala Met Asp Asn His Val Ala Gly
343      210      215      220
345 Leu Gly Pro Ala Glu Glu Arg Arg Ala Leu Val Gly Pro Gly Ser Pro
346 225      230      235      240
348 Pro Arg Ser Ala Pro Gly Gln Leu Pro Ser Pro Arg Ala His Ser Leu
349      245      250      255
351 Asn Pro Asp Ala Ser Gly Ser Ser Cys Ser Leu Ala Arg Thr Arg Ser
352      260      265      270
354 Arg Glu Ser Cys Ala Ser Val Arg Arg Ala Ser Ser Ala Asp Asp Ile
355      275      280      285
357 Glu Ala Met Arg Ala Gly Val Leu Pro Pro Pro Pro Arg His Ala Ser
358      290      295      300
360 Thr Gly Ala Met His Pro Leu Arg Ser Gly Leu Leu Asn Ser Thr Ser
361 305      310      315      320
363 Asp Ser Asp Leu Val Arg Tyr Arg Thr Ile Ser Lys Ile Pro Gln Ile
364      325      330      335
366 Thr Leu Asn Phe Val Asp Leu Lys Gly Asp Pro Phe Leu Ala Ser Pro
367      340      345      350
369 Thr Ser Asp Arg Glu Ile Ile Ala Pro Lys Ile Lys Glu Arg Thr His
370      355      360      365
372 Asn Val Thr Glu Lys Val Thr Gln Val Leu Ser Leu Gly Ala Asp Val
373      370      375      380
375 Leu Pro Glu Tyr Lys Leu Gln Ala Pro Arg Ile His Arg Trp Thr Ile
376 385      390      395      400
378 Leu His Tyr Ser Pro Phe Lys Ala Val Trp Asp Trp Leu Ile Leu Leu

```


RAW SEQUENCE LISTING ERROR SUMMARY
PATENT APPLICATION: US/10/000,151A

DATE: 05/13/2002
TIME: 09:08:40

Input Set : A:\HERG-KCR1rev1.ST25.txt
Output Set: N:\CRF3\05102002\J000151A.raw

Please Note:

Use of n and/or Xaa have been detected in the Sequence Listing. Please review the Sequence Listing to ensure that a corresponding explanation is presented in the <220> to <223> fields of each sequence which presents at least one n or Xaa.

Seq#:1; N Pos. 1494,1624,1647,1649,1654,1674,1675,1676,1678,1682,1692,1696
Seq#:1; N Pos. 1711,1712,1714,1717,1725,1732,1738,1739,1744,1745,1750,1755
Seq#:1; N Pos. 1756,1757,1759,1763,1767,1768,1769,1773,1777,1778,1779,1782
Seq#:1; N Pos. 1783,1784,1786,1830,1849,1853

VERIFICATION SUMMARY

DATE: 05/13/2002

PATENT APPLICATION: US/10/000,151A

TIME: 09:08:40

Input Set : A:\HERG-KCR1rev1.ST25.txt

Output Set: N:\CRF3\05102002\J000151A.raw

L:13 M:271 C: Current Filing Date differs, Replaced Current Filing Date
L:154 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:1 after pos.:1442
L:160 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:1 after pos.:1622
L:162 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:1 after pos.:1682
L:164 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:1 after pos.:1742
L:166 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:1 after pos.:1802